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ABSTRACT

This paper presents a model for continuous, systematic evaluation of ongoing programs and specifies data needed for decisionmaking in the areas of program adoption, curtailment, or expansion. These data give the decisionmaker the necessary information for program planning in today's sophisticated educational environment. (Author/RA)

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THE ANALYTICAL ASPECTS OF EVALUATING ON-GOING PROGRAMS

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Analysis has been misinterpreted by educators--and even maligned. I think there are three reasons for this. First, we have been schooled in the principles of classic research design, and many educators remain hung up in this process, despite its often being inappropriate as an evaluative technique. Second, analysis has often been represented as being esoteric and requiring the use of sophisticated techniques, tremendous information systems and large computers. And thirdly, a strong belief that "education" is a human process and cannot be quantified. The first two objections are rather obviously more amenable to correction. The principles of research design are flexible enough to encompass good evaluation design and practice. The more complex techniques of analysis and computers are helpful, of course, but so are the simpler techniques. The problem really lies in the third point: education cannot be quantified and for that reason analysis is inappropriate. This paper addresses this problem and suggests ways educators can meet the analysts more than halfway.

I will agree that some aspects of educational outcome are more difficult to quantify than others, but I will suggest that an informed estimate of an outcome measure is better than nothing. Before we say that analysis is complex and unsuitable, let's see what is required for good analysis, what we can expect it to do for us, and how a cooperative effort between educator and analyst can lead to a better understanding of an educational system as it currently operates, and to a systematic exploration of the alternatives available to improve the system. The purpose of analysis is to aid in making decisions that lead, among other things, to program improvement. Since most

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decisions about the implementation of programs to meet educational objectives are made at the school district level, we will concentrate on analysis for improvement of programs in a district.

REQUIREMENTS FOR A GOOD ANALYSIS

The educator needs to decide what specific question he wants to address, needs to state it in a form that can be answered, and needs to know what information is necessary for arriving at that answer.

Let's use one example that we can develop to illustrate these requirements, as well as to illustrate the kinds of results we can expect and how the educator and the analyst can work together to achieve program improvement.

Before formulating a question, we need to briefly describe the problems facing the district decisionmakers. I think it not unreasonable to postulate the following situation:

- Twenty percent of the students in the district score two years or more below national norms in arithmetic.
- Twenty-three percent of the students in the district score two years or more below national norms in reading.
- Absenteeism and truancy are at an all-time high.
- A bond issue has just failed to pass.
- There is talk of a teacher strike because failure of the bond issue means no increase in pay, and no money to hire more teachers to relieve overcrowded classrooms.

It goes without saying that all these problems cannot be tackled simultaneously even though they are interrelated in a very real sense. It is also obvious that solutions cannot be found for all of them simultaneously, but that it is well within the state of the art to tackle some of the basic educational problems, subject to external operating constraints--i.e., the large number of low achievers. We've already met the first requirement for a good analysis: we have determined that there is a specific question that we can address.

The question might well be stated as "What alternative educational services can be provided by the district so that students in the math and/or reading programs achieve better?" We can use either math or reading as an illustration because analysis of either program will have the same set of requirements. Let's also recognize that we are talking about only one of the possible objectives of the program--achievement--but any other objective could be treated by the same methodology.

The next requirement for a good analysis is to specify the data that will be required to answer the question. In so doing, what we are really aiming for is a description of the program as it now exists. This, in turn, is a first step toward developing the capability for carrying out an on-going systematic evaluation of a districts' educational programs. It is only by having a detailed knowledge of what is being done today, with what outcome, that we can attack the problem of what needs to be done to improve the program.

In order to build the base case or to describe the current program in arithmetic, for example, what data do we need? Since our concern as educators is not with district averages, or with school averages, but with individual students, ideally we would do our analysis at that level. In the interests of reality, however, that will remain for the moment as a goal to strive for, except in a very small school district, and we'll consider an analysis at the classroom level.

By themselves, achievement data yield information only about outcome. What is needed is a description of the school environment that produced the achievement. To answer our question, information is needed about what programs are provided, what resources they require, and what achievement they produced. Even in a large district, this kind of data can be handled without a computer, if it is approached by program. One can envision a simple table that displays the basic information. It would essentially show achievement data in arithmetic for each classroom, for each grade in each school. It would, in addition, show the mean district achievement score for each grade. (see Fig. 1)

Fig. 1

ILLUSTRATIVE ACHIEVEMENT SCORES BY CLASS
(Spring Test Results)*

		SCHOOL 1				.... SCHOOL N		
DISTRICT MEAN	GRADE	CLASS				CLASS		
		A	B	C	D	A	B	C
1.7	1	1.7	1.5	1.4	1.4	1.8	2.0	1.7
2.6	2	3.0	2.6	2.4	2.7	2.4	2.4	2.6
3.7	3	3.6	3.8	3.2	3.7	3.5	3.9	3.9
	• • •							
	N							

* SCORES REPORTED AS GRADE PLACEMENT EQUIVALENTS

What Can Be Expected From an Analysis

Before we explore what this kind of simple analysis will do for us, let's return for a minute to the stated objections to analysis and re-examine them. We said first that educators cling to research design. What we have done here is move one step away from classical research design toward the goal of setting up an on-going evaluation. We have arrayed the outcome data for a program so that we may start to examine the environments that contributed to those outcomes. As in good research design, we are looking for differences, but in contrast to having controlled on a set of variables before treatment was instituted, nothing was artifically arranged, and we are now able to assess what happened under varying conditions.

The second postulated objection to analysis was that it required sophisticated techniques, large information systems and powerful computers. The analysis we have just set up can be done without any such trappings.

Thirdly, we said that the major obstacle was that education cannot be quantified. If we accept the fact that education is a complex system made up of many components, and if we are willing to focus on those components, one at a time, we should eventually be able to better understand the interrelationships that comprise the system. For the time being, we should take first steps, and try to use analysis to help us solve the most pressing problems, one at a time. As educators and analysts work together on individual problems, they will both develop the insights necessary to tackle the more complex problems.

Let's come back now to the information we have collected to help us address the problem of providing educational services to attain better achievement in arithmetic. By looking at an array of scores by classroom, we can quickly get a picture of where our attention needs to be concentrated.

If I were a school district administrator, I would want to focus my attention on two kinds of classrooms: those where achievement was better than normal and those where it was less than satisfactory. The array of scores suggested here allows us to do just that. We are now in a position to ask a series of

questions relating to the environment in which the deviant achievement scores occurred. We really want to do this for two reasons. If some curriculum or teaching mode is succeeding better than others, one of our alternatives for improving the program is to encourage wide-spread adoption of the successful technique. Conversely, if a detailed description of each classroom that we have isolated for study shows that some technique is not yielding good outcomes, there is now good objective data to support some change in the classroom.

It is not my intention to gloss over the large amount of work involved in creating a description of each classroom that is meaningful for the task at hand. It is my intention to say that it is an effort that can lead to improvement in the educational system. Our one quantitative measure is our outcome measure--achievement. But, as was said previously, we need to be able to describe the school environment that produced the achievement, because it is that environment, or parts of it, that will have to be changed to improve the outcome measures.

A Cooperative Effort Between Educator and Analyst

I've talked about only the simplest kind of analysis. But I think of it as a first step toward a systematic way of looking at school programs, and considering the alternatives that are available for improving them. We need to analyze our problems one at a time, and given limited resources, we should probably concentrate on the most pressing problems. As the analyst and the educator work together each will bring to the analytic problem insights which will eventually give them the capability to consider complex problems and use more sophisticated analytic techniques. For the moment, analysts must be keenly aware of the fact that educational outcome measures are not particularly reliable. Educators must, on the other hand, be ready to accept the simple analytic techniques that are appropriate to the level of sophistication of their outcome measures.